OUR ASTRONOMICAL COLUMN

THE DOUBLE-STAR B.A.C. 1972.—Capt. Jacob, reviewing the measures of this object, first registered double by Dunlop with his 9-feet reflector at Paramatta (No. 23 of the Catalogue of 253 stars), remarked of it in 1858: "the angle is, on the whole, evidently advancing, and the distance decreasing, but the measures are strangely wild, considering the easiness of the object, and seem to indicate the presence of some perturbing body." For comparison the following may be selected:—

Dunlop ...	1826·00	Position	329°·0	Distance	3″·00
Herschel ...	1835·02	,,	342·5	,,	3·86
Jacob ...	1846·94	,,	348·5	,,	3·22
,, ...	1852·73	,,	350·7	,,	2·81
,, ...	1858·17	,,	354·7	,,	2·18

Jacob's measures of 1858 are the last we find; he considered an appulse would take place about 1875.

Dunlop says of the results in his catalogue similar to the above, the "positions and distances are only estimations while passing through the field of the 9-feet telescope," and no great stress, therefore, need be placed upon them. If we assume that the change of angle and distance is the effect of proper motion, a comparison of Sir John Herschel's measures of 1835, with the later ones at Madras, leads to the following formulæ:—

$$\Delta\alpha = -0''\cdot7876 + [8\cdot80975]\,(t - 1850)$$
$$\Delta\delta = +2\cdot6926 - [8\cdot81900]\,(t - 1850)$$

Whence we find for 1876·75, position 34°·4, distance 1″·13, showing a considerable change since the last published measures, which should render it easy for one of our southern readers to decide upon the cause of the apparent motion. In the case of rectilinear motion the nearest approach would fall in 1881 or 1882, on an angle of from 50°–55°, and in 1891 the component which we are taking for the companion (though the stars appear of equal magnitude—the seventh) would be upon the parallel following 1″·2. So much is to be gathered from the data at present in our possession. The position of the star for 1876 is in R.A. 6h. 1m. 35s., N.P.D. 138° 27′.—It should be added that the above formulæ give an angle of position for 1826·0, differing 11° from Dunlop's estimation and the distance greater by 2¼ seconds.

THE SECOND COMET OF 1844.—The period of revolution assigned to this comet by Prof. Plantamour, of Geneva, after a most minute discussion of the observations, is upwards of a thousand centuries, with a probable error of about thirty centuries! Such a result may be regarded with suspicion by many, but let us see upon what grounds it has been founded.

The second comet of 1844 was independently discovered by Mauvais, at Paris, on July 7, and two nights later by D'Arrest, at Berlin. It was observed before the conjunction with the sun and perihelion passage until September 7, and was found at the Royal Observatory, Cape of Good Hope, on October 27, and observed with great precision on forty-eight days at that establishment until March 10, 1845, when it was distant from the earth 2·9, and from the sun 2·4. The later European observations are those taken at the Royal Observatory, Greenwich, on March 4, and at Berlin on March 6. 545 observations of position were available for the determination of the orbit, and are discussed in the *Mémoire sur la Comète Mauvais de l'année*, 1844, by Prof. Plantamour. He started with the parabolic elements of Nicolai, which had led to the re-discovery of the comet in Europe after the perihelion passage, on January 27, 1845. The perturbations due to the action of Venus, the Earth, Jupiter, and Saturn, during the whole interval of observation, were rigorously determined and taken into account, and after a double solution of equations of condition founded upon normal positions, thus freed from the slight distortions due to planetary attraction, the deviation of the eccentricity from unity was found, with a probable error of only $\frac{1}{50}$th part of the amount of this deviation. The resulting definitive orbit is an ellipse with a semi-axis major = 2183·8; the corresponding period is 102,050 years ± 3,090. This value of the time of revolution is founded upon an arc of the comet's orbit, extending to 204°, described in eight months.

The aphelion distance of the comet is 4,366 times the earth's mean distance from the sun, a space which light would require twenty-five days to traverse, and yet little more than a fiftieth part of that of the nearest fixed star according to our present knowledge, a suggestive fact when the visits of comets to other systems are under discussion.

NEW NEBULÆ.—M. Stéphan, Director of the Observatory at Marseilles, has communicated to the Paris Academy a list of twenty-three new nebulæ detected with the Foucault telescope of 0·80 m. aperture, which raises the number of such discoveries, so far published, to 120; but M. Stéphan mentions that he has approximate positions of about 400 new nebulæ, between 45° and 100° N.P.D., and hopes yet to considerably increase this number. As might be expected, the twenty-three new nebulæ are mostly very faint; one only is called "pretty bright—very small—round" in R.A., 17h. 6m. 47s.; N.P.D., 48° 11′·7, for 1876·0.

THE NORWEGIAN NORTH ATLANTIC EXPEDITION

Reikiavik, July 27

IN continuation of our last account we hear that the expedition has been not at all favoured by the weather. Since it left Christiansund, June 27, it has met with no less than five storms (wind velocity, forty-five miles an hour); two in the "Lightning" Channel early in July, one at Thorshaven, one north of Färoë, and one at the Westman Islands (off the south coast of Iceland). It has been only in the short intervals between these storms that any deep-sea work has been done. The last days of June were fine, so the expedition sounded, dredged, and trawled off Christiansund on the bank called "Storeggen." Here the fauna was quite Atlantic; on the outer edge of the bank the water deepened to 300, 400, and 500 fathoms, and the ice-cold water was met with, yielding an Arctic fauna. Two large specimens of *Umbellularia* (the same as earlier) were found, with a new star-fish and an animal which is quite new to the naturalists on board. Of smaller organisms there were also several new ones.

In lat. 63° 10′ N., long. 1° 30′ W., a sounding in 1,050 fathoms gave a temperature under 32° below 300 fathoms. The *Vöringen* had to leave this station to refit, as a sea had carried away the two fore-hatches. The course was shaped for Thorshaven, where the expedition stayed eight days to refit (July 8–15). The stay there was very interesting, especially for the geologists. The formation of caverns at sea-level was an operation visible in all stages of progress. In the zoolite caverns of Naalsö a rich harvest of minerals was secured.

The inhabitants of Thorshaven received the expedition very hospitably, and remembered, with great pleasure, the stay of the *Lightning* and *Porcupine*.

After a trip round the main island to Westmanhaven, the *Vöringen* left Färöe, July 16, and steered for its last station. Bad weather brought work here to a speedy conclusion; however, a series of temperatures were obtained, indicating ice-cold water at a depth of 300 or 400 fathoms. On the north-eastern corner of the Färöe bank the depth increases very rapidly. In lat. 63° 22′ N., long. 3° 30′ W., soundings gave 1,180 fathoms. A series of temperatures gave 32°·4 in 400 fathoms, 31°·8 in 500 fathoms, and the bottom temperature was 29°·8. In lat. 63° 55′ N., long 7° 10′ W., 30°·2 in 677 fathoms; in lat. 63° 3′ N., long. 10° 15′ W., 37°·2 in 256 fathoms. Further

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west the bottom temperature was found to be 46°·2. Bad weather prohibited dredging, so the course was laid for Reikiavik, but heavy S.W. winds and sea made the progress very slow. July 22, Iceland was made in the morning, but in the afternoon the weather got so wild and thick that shelter was sought at the Westman Islands, a group of small islands off the south coast of Iceland. Here a stay of three days was made; during one of them there was a heavy gale, in which steam was kept up. The visit here proved very interesting. The whole of the islands are volcanic; a large old crater, with perpendicular walls 400 to 500 feet high, is visible; one side is standing, the other has been washed away by the sea. Two miles off is a more recent cone, 770 feet above sea-level, in full preservation, with a hollow 50 feet deep on top. The base of the cone is lava; the cone itself, whose outline is beautifully geometrical, is composed of loose stones. The sea-birds are very numerous, living in the countless hollows in the cliffs, where they were hatching at the time of the visit. Whales, large and small, were about the ship.

Westmaney was left July 26, and Reikiavik reached that evening. On the south coast of Iceland the current was very strong to the eastward, and from Cape Skagi to Reikiavik its violence was fearful.

The Icelanders reported that they have very seldom had so bad a summer as this one—perpetual storm and rain. This has not been favourable to the expedition except as regards meteorology. In this branch hourly observations have been regularly taken when at sea.

The expedition was to stay at Reikiavik five or six days for coaling and for magnetic base observations. Hardly any magnetic observations have been obtained at sea, the weather having been so boisterous. It was intended to give up making the circuit of Iceland (the ice on the north side went away in June), and to take up a line south of Iceland, and then straight across to Norway, about to Namsos. The scientific staff is very well contented with the results gained, in spite of the bad weather.

(*From another Correspondent.*)

The Atlantic Expedition, under the leadership of Prof. Mohn and Prof. Sars, sent by the Norwegian government for the exploration of the North Atlantic and for making a *tour* round Iceland, give some intelligence as to their proceedings in a letter from Thorshavn (Färöe Islands), dated July 11 and 14, printed in the Christiania newspaper, *Morgenbladet*, of Aug. 2. This letter, the substance of which we reproduce, gives information on the cruise of the expedition in open sea, after its having left Christiansund. On June 27 the steamer left Christiansund and went westward. In the evening soundings were taken at a depth of 87 fathoms, and the temperature of the water proved to be as high as 7° C., between 10 fathoms and the bottom. The following day, the island Storeggen was reached; the temperature of the water was here 7½° C., at a depth of 230 fathoms, and the animal life, belonging all to the "warm region," was of the highest interest. On the 29th, the steamer going further westward, the depth still increased and soon reached 418 fathoms, where the thermometer showed an icy-cold sheet of water, sharply divided from the upper warmer sheet, the temperature at 300 fathoms being + 6°, and − 1° at the depth of 418 fathoms. On the 30th the weather was very fine, and the trawl-net was used, an English fishing-net, which brought some remarkable forms (*e.g.* large *Umbelliferæ*) from the depths of the cold sheet of water. On July 1 the thermometer showed − 1° C. at the depth of 570 fathoms. In the afternoon the weather changed, the wind began to blow very strongly from S.S.E., the barometer fell, and the steamer took a S.E. direction. On July 2 the wind reached the strength of a storm, the waves had a height of 18 feet, which height diminished afterwards to 12 and 10 feet. The bad weather continued until July 4, and it was not till the 5th that the steamer could return to her former route, and the soundings and the fishing could be continued. On the 5th soundings were taken at a depth of 1,050 fathoms, temperature at the bottom − 1° C. The dredging apparatus was sent to this depth, and dragged for six hours: it brought up a very interesting collection, which proved that even at this depth, and in such cold water, animal life is very variable at different parts of the bottom. But the zoological labours were soon interrupted anew by a gale coming from the south; the height of the waves was measured and found to be 25 feet, and the steamer received some damage, which forced the expedition to go to the Färöe Islands. On the 8th the expedition landed at Thorshavn, and it was not till July 14 that, necessary repairs being made, the steamer could go further. These circumstances, and the reports of much ice round Iceland made it very probable that the expedition will not make, this year, the proposed *tour* round that island.

The scientific results of the expedition—says the writer of the letter—are already considerable. The depths of the sea, and the distribution of temperature with the depth are certainly such as might be supposed, but the animal life exhibits a much greater variety of forms than could ever have been expected, so that the explorations of the summer will give a very general idea as to the organic life of this latitude.

MR. O. C. STONE'S EXPEDITION TO NEW GUINEA

A GOOD deal of speculation has been rife as to the above expedition of Mr. Stone (Cf. *Ibis*, 1876, p. 363) into south-eastern New Guinea, as the collections sent by the Italian traveller, D'Albertis, had by no means answered the expectations of naturalists as regards novelties, and as Mr. Stone was known to have engaged the services of two good *préparateurs* in the persons of Messrs. Petterd and Broadbent, it was confidently expected that a great deal that was new to science would be brought to light. After a cursory examination of the birds obtained during the expedition, it becomes quite evident that the neighbourhood of Port Moresby is a very unproductive one as regards ornithology, when compared with the rich fields in the north-western part of New Guinea, which have lately yielded as many as fifty-two undescribed species of birds to the Italian traveller, Dr. Beccari. At the same time Mr. Stone's collection has taught us some very interesting facts by proving that the Papuan element in the avifauna of south-eastern New Guinea, consists rather of Aru forms than of Salwatti or Dorey species. Many birds are, as might be expected, specifically the same as those of Cape York, but the large number of Aru birds is very striking. I am preparing a full account of the collection for publication, but meanwhile I send a notice of the expedition for the readers of this journal, and add short details of one or two species which appear to be new to science.

Mr. Stone started from Somerset, Australia, on October 21, 1875, and after remaining a few days at Yule Island, where Signor d'Albertis was then collecting, he reached Port Moresby, New Guinea, about sixty miles further to the south-east, on the 29th of the same month. Although his principal object in visiting the island was to gain ethnological and geographical information, he took with him, as mentioned above, two taxidermists. Anuapata, where he erected his tent, is situated upon the shores of Moresby harbour, in long. 147° 7′ E., and lat. 9° 28′ S., and from here several preliminary excursions were made. At first the natives showed some fear, but on seeing that the object of the visitors was peaceable, they soon gained confidence, and the younger members of the community frequently assisted in carrying back the game shot. During the months of December and

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